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Pam.

*The Jack Fish Lake Gold and Silver mine*

THE JACK FISH LAKE  
*Now (1884) "Huronian"*  
GOLD & SILVER MINE,  
LAKE SUPERIOR, ONT.

1882.

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# THE JACK FISH LAKE GOLD AND SILVER MINE.

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The property consists of a mineral location on which there is a rich gold and silver bearing vein and is known as "The Jack Fish Lake Mine." It may be more particularly described as mineral location H 1, near Jack Fish Lake, in the township of Moss, in the District of Thunder Bay, in the Province of Ontario and Dominion of Canada and containing 160 acres.

The property is from 85 to 90 miles from Fort William, on Thunder Bay, Lake Superior, by the old route. By the proposed new one it is distant from Fort William about 110 miles. The Canada Pacific Railway now passes within 40 miles of the mine.

This rich vein was discovered in 1871 but the mine has not been systematically worked heretofore for various reasons, the chief of which were that at the time of its discovery the Indians of the district had not been settled with by the government, and they forbade mining operation on a large scale till they were, and during the lifetime of the late Captain Frue, of Silver Islet, one of the early proprietors of the mine, there were no Railway facilities. But now the Indians are settled with by treaty with the government, and the Canada Pacific Railway is constructed from Fort William to Winnipeg. It was advertised to be open for traffic on the 18th of this present month of September, 1882.



The most convenient access to the mine now will be via The Canada Pacific Railway from the town plot of Fort William to Savanne, a distance of 70 miles; thence by boat, via Savanne River and Lac des Milles Lacs (which are both navigable), to Barril Portage, about 25 miles; thence by road to be made to the mine, a distance of about 15 miles. Savanne can also be reached now via Winnipeg and the C. P. Railway.

The title to the property is derived by patent from the Crown and subsequent conveyances in fee simple. It is held free from incumbrances and is not subject to royalty or other crown dues on the minerals.

At the instance of the late Captain Frue, who became a purchaser of an interest in the property shortly after its discovery for a large sum of money, the mine was examined by Mr. Walter McDermott, Mining Engineer and late Assayer of the Silver Islet Mining Company, and his report is printed herewith.

By the more recent report of Mr. Peter McKellar<sup>a</sup>, of Fort William, Mining Expert and Geologist, and the certificates from the two well known Metallurgical Houses in New York, Messrs. Ledoux & Ricketts, and Messrs. Mathey and Riotte, published herewith, the results of thorough practical tests are shewn.

The report of Mr. McKellar, and the certificate of Messrs. Ledoux & Ricketts (No. 1), shew that a sample of the high grade ore from this mine yielded on assay at the rate of \$5,971.60 per ton of 2,000 lbs., or gold \$4,752.03, silver \$1,219.57; and by the same report and the certificate of the same firm (No. 2), it is shewn that by a large assays, after crushing and sampling a whole ton of the average ore of this mine, the average ore yielded at the rate of \$49.28 per ton, or gold \$36.30, silver \$12.98.

The certificate of Messrs. Mathey & Riotte (No. 3) also referred to in Mr. McKellar's report shews the ore to be free milling ore, and that the tailings can be concentrated to advantage afterwards. By Mr. McKellar's report and Messrs. Mathey & Riotte's tests and certificate it is shewn that a ton of the average ore of this vein yields by free milling at the rate per ton of \$26.24 gold, and that the concentrated

tailings are worth \$82.43 per ton of concentrated ore or gold \$76.62, silver \$5.81.

Mr. McKellar's report and that of Mr. McDermott contain a description of the property and estimates of its capabilities and from these the character value and prospects of the mine can be judged.

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## REPORT OF MR. WALTER McDERMOTT,

### JACK FISH LAKE LOCATION.—SHEBANDOWAN.

In the winter of 1872-3 in company with Captain Frue, I visited the Jack Fish location, which is situated about 85 miles west of Thunder Bay, Lake Superior.

The gold-bearing vein, on which some little work had then been done, is situated on one side of, and running parallel with, a narrow valley formed by walls of granite on the one hand and green stone on the other. The vein itself rests on the granite wall but with an interposing thin belt of talcose slate preventing actual contact. For several hundred feet on both sides of the principal working, the vein has been traced, but as the period of my visit was mid-winter, with its customary heavy covering of snow, my personal observations were confined to the points at which work was actually in progress. At different points of the principal opening, the vein varied in width from 2 to 7 feet, and consisted of quartz, with occasional patches of yellow magnesian spar. The minerals contained in the gangue were principally copper and iron pyrites, light colored zinc blende, galena, and with varying small proportions of free gold and sylvanite (telluride of gold and silver). The sulphurets appeared from a number of assays to carry always a small though variable quantity of both gold and silver, the two metals maintaining a pretty constant relative ratio; and occasional streaks of the mixed sulphurets, differing but very slightly in appearance from the bulk of the mineral, yielded quite richly on assays. The occurrence of the free gold and sylvanite, generally, though not always, in conjunction, was irregular but not

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infrequent; for during the three days I remained on the spot, several separate blasts developed rich portions of the vein, from which many very fine specimens were obtained, showing free gold in strings, spangles and small nuggets, and streaks, coatings and small masses of the extremely valuable sylvanite ore. This sylvanite was first mistaken by the miners for silver glance, but assays and analysis proved it to be the true telluride of gold and silver, some samples of the sulphurets through which it was mixed yielding on assay up to \$4,000 per ton in gold and silver, chiefly the former. From some few barrels of the ore taken to Silver Islet, 123 lbs. of rock was selected and sent to Balback's smelting works in New Jersey, the works returning as a result a small brick of silver and button of gold, weighing respectively  $5\frac{1}{2}$  and 1.16 oz.

Of course it is not to be supposed that so high a result represents the average of the rock; nor does it any more represent the best that could be obtained, since a little more rigorous selection of the sample sent could easily have made the latter yield double or quadruple the *percentage* of gold and silver, as any person will understand when it is understood that many samples could be selected carrying free gold alone or with the rich sylvanite.

A road has been cut through the woods, a distance of 12 miles, and connecting the mine with Lake Shebandowan, and thereby with the Red River Road to Thunder Bay, the route of the Northern Pacific Railroad branch, at present in process of construction. The immediate neighborhood of the mine is heavily timbered, the trees being of good growth and various qualities, offering everything in the way of timber supply for mining purposes. The occurrence of the soft talcose slate on a hard wall is very favourable for the breaking out of the vein, and leaving a good wall requiring hardly any timbering.

WALTER McDERMOTT,  
*Mining Engineer & late Assayer,*  
*Silver Mining Co., of Silver Islet.*



## REPORT OF MR. PETER McKELLAR.

### THE JACK FISH LAKE MINE.

The Jack Fish Lake Mine, consists of a block of land half a mile square, containing 160 acres, with a rich gold and silver bearing lode running diagonally through the property near the middle.

This rich vein was discovered in 1871 and was the first known free gold discovery on Lake Superior. The following year, the many rich gold and silver specimens taken from it and distributed all over the country, created much excitement. At the time that section of country was in the possession of the Indians and they strongly objected to any improvement being made by the whites until a treaty was consummated. Besides that, the access to the mine was 90 miles of alternate stretches of land and water, which would render the cost of transportation of machinery and supplies very great. For these reasons it was decided by the owners, to let the mine rest until these obstacles were removed. Again Captain Frue, of Silver Islet, who had purchased a half interest in the property immediately after its discovery for \$20,000, was not alive to prosecute the work of the mine when these difficulties ceased to exist.

I may mention, that although, following its discovery the vein was well examined by mining crosscuts and excavations, yet, no practical test was made to ascertain the value of the average ore. At one place 10 feet were sunk, and about 100 tons of ore blasted out which now lies on the dump. From this, some of the richest ore only was taken away, of that, the best was distributed amongst friends and specimen hunters all over the country, the balance 123 lbs. was sent to Balback & Sons, Newark, New Jersey, and smelted. It yielded \$517.98 to the ton, or gold \$396.80, silver \$121.18. The button of gold produced weighed 1.16 oz., value \$24.60. It is now in the possession of Mrs. J. McIntyre, of Fort William. Many assays were made of the different kinds of ore in the lode with varying results from a trace up to thousands of dollars to the ton, but no test was made with a view to an approximation of the real value of the lode or to find out by which

process it would work to the best advantage until lately, so that it was, to a certain extent, enveloped in uncertainty.

Now the obstacles to the working of the mine are removed. The Indians have been settled with by treaty with the government, and the C. P. Railway was opened for business on the 18th of this month. Savanne, one of the railway stations 70 miles from Thunder Bay is connected to the mine by about 25 miles of water on Lac des Milles Lacs to Barril Portage and 15 miles by land between Barril Portage and the mine. Again the complete tests hereafter referred to made by the two leading metallurgical works in New York of a ton of the average ore from this lode prove beyond a doubt that it is a mine of great value and that it will require but a comparatively small amount of money to make it begin yielding returns as will be shewn further on.

#### GENERAL FEATURES.

The property consists of flat, mossy, low land with undulating rocky ridges covered mostly with sandy soil suitable for grain and roots. Both high and low are well covered with the usual timber of the district, suitable for mining purposes; there is also a small stream of water running within 50 to 100 feet of the lode in an admirable position, for supplying the stamp mill for washing purposes. For the most part of the year there is plenty of water, and with a small expenditure, it can be made to supply all requirements for all seasons.

#### CHARACTER OF FORMATION.

The rocks on the location consist of semi-crystalline greenish slates, talcose, chloritic, dioritic, &c., with massive diorite and silicious magnetite, all interbedded and conformable with one another, and dipping at a high angle  $60^{\circ}$  to  $80^{\circ}$  towards the N. W. About a mile to the N. E. these strata, are displaced by an intrusive syenite, an allied rock to granite, in which the bed of Jack Fish Lake is cut out, and it is probable that to the presence of this intrusive syenite, the existence of this gold vein is due. These rocks belong to the Huronian series. Professor R. Bell in his report of the mineral bearing rocks of Lake Superior which appeared in the "Globe," March, 1874, states, "The gold of British Columbia and other regions occurs in rocks similar to those of the Huronian series."



## CHARACTER OF VEIN.

I have examined this lode at various places for a distance of about 2,000 feet on this location. It is subject to expansions and contractions like other veins, but on the whole it appears to be 6 to 8 feet wide within the walls consisting of quartz with a central belt of soft talcose slate, two to four feet wide charged with iron pyrites and some gold, which may pay to work in places. The vein dips N. W. at an angle of about  $75^{\circ}$  to the horizon and bears north eastward, cutting the strike of the slates at a small angle. On either side it is bounded by greenish slates that are more or less talcose in character. It is an undoubted true fissure vein, and gold veins that carry much of the sulphurets like this one are considered as reliable for carrying in depth as fissure veins of other metals.

The quartz are 2 to 5 feet wide, charged with galena, iron and copper pyrites, zinc blende and the sulphurets of silver and tellurium with spangles and grains of gold large and small disseminated through the whole in more or less quantities, but more plentiful along with, and in the vicinity of the ores of silver and tellurium, which make in bunches here and there through the vein. These bunches yield several thousand dollars to the ton and are likely to be found in places large enough to be worthy of being called "bonanzas." For result of an assay of the high grade ore see certificate of assay of Ledoux & Ricketts (No. 1). Independent of this rich ore, the balance of the quartz shows an average yield of \$45 to \$50 to the ton, and by the thorough tests lately made of the ore in a large way \$26 of gold to the ton can be taken out by the free milling process or copper plates, which can be cheaply worked. Ten dollar a ton ore, free milling would pay well at this mine. In Australia, mines are worked at as low as \$3.00 a ton and pay 10 per cent. on the capital invested; but of course this is under very favorable circumstances. In the Black Hills of Dakota, ore yielding 6 to 8 dollars when free milling is worked very profitably.

## THE TESTS.

This summer I was engaged to have a fair average test of the ore of this lode made. I took a gang of men and proceeded to the mine. All the exposures of the vein were examined and I found the

vein stone remarkably uniform in character. I made several tests of the ore from various points on the vein by pulverizing, roasting and washing which shewed considerable gold; some tests shewing coarse gold. In making these tests I did not select ore shewing gold to the eye; and some of the samples were of the lode near the middle of the location and others from the portion near the southern boundary, 1,300 feet apart.

I also took out a ton of the average ore, half of this ton was blasted out of the bottom of the principal excavation (from which the 100 tons referred to were mined) at a depth of 11 feet. I took it as it came without selection. The other half ton was taken out in the same way from the surface at a point on the vein where it enters the valley, 60 feet to the S. W.; here the quartz is 5 to 6 feet wide. I took this ore to New York and had it tested by two leading metallurgical firms Ledoux & Ricketts, and Mathey & Riotte. The former crushed the whole ton and sampled it with much care down to 200 pounds; this they put through another finer crusher and sampled it down to a few pounds, and made two large assay tests which shewed an average of close on \$50 to the ton. See their certificate (No. 2). Then I took 250 pounds of the first part sampled. I sent this quantity to Mathey & Riotte to have it tested in different ways, and also to see how the two would compare. They ground it fine, sampled and assayed it, the yield shewing \$46.80 to the ton.

Then they stamped it and run it over the copper plates, which caught \$3.28 g. 'd, or a yield shewing \$26.24 to the ton. The tailings were then assayed and gave an average yield of \$20.26 to the ton. In this test, as will be seen by their certificate (No. 3) it shewed an average of \$40.06 of gold to the ton independent of the silver of which there was a considerable loss. Then the tailings were run over Frue's vanners and concentrated to 11 4-10 per cent. or about  $8\frac{1}{4}$  tons into one. The concentrations assayed \$82.48 to the ton, that is an average to the ton of ore of \$9.42, which, with the \$26.42 saved on copper plates, makes \$35.66 saved by milling. Assays of the balance shewed a loss still in the tailings of \$9.42 to the ton. The test was made by a small vanner, I believe the large vanner will do much better work. Mr. Goldsmith, the manager of the works said the ore was good ore to work and that a large mill

would easily show as good or better results from the same ore. I was present in New York and saw these tests made. I am convinced of their thoroughness and correctness.

#### ROUTE TO MINE.

In regard to starting the mine, I would advise taking in the machinery and supplies by way of the railway to Savanne, thence by the chain of lakes and Dawson's Portages to the head of Lake Shebandowan, and thence over the old road, cut out several years ago,  $12\frac{1}{2}$  miles to the mine. By this route, a passable winter sleigh road can be made available at a trifling cost for the first winter's use. The machinery should be taken to the mine in January, when the ice is good and before the snow gets deep. This route could not be used to advantage in the summer, but by spring the new one by Barril Portage could be opened out for traffic—the latter consists of one stretch of land and one by water to the railroad.

#### COSTS OF OPERATING THE MINE.

I would recommend starting the mine on a basis of 14 tons a day by using two batteries (10 heads) of stamps with copper plates for catching the free gold attached. Also two of Frue's vanner's for concentrating the tailings from the free milling process. As shewn by the tests, the copper plates would catch about \$26 per ton gold, bullion, cash on hand as produced, which of itself would far exceed the expense of operating the mine. The product of the concentrations at \$82 per ton after all expenses in connection with shipping and treatment were deducted would yield an additional profit of about \$35, per ton of concentrations equal to about \$4 to the ton of ore. In a short time the mine would be self-sustaining, and in less than 6 months it would be able to pay back all the working capital invested. Its capacity should be increased as results would justify. I have made enquiry as to the best machinery and the cost of the same. I have also made close estimates of the cost of getting the machinery and all necessary supplies to the mines, and also of the cost of operating, and of the yield of bullion from the mine, which, as near as I could calculate, would be as follows :

Allowing that work was commenced by the first of December, the



mine equipped and operated for six months on the above basis of 14 tons a day, with a further supply of all material and provisions to carry on the work for another two months on hand, (the latter supply being necessary until the road to Barril Portage would be ready for the summer's work), then, the returns and expenditure for the first 6 months would be as per Schedule A, as follows :

#### RETURNS FROM THE MINE.

Three months' work of free milling to 1st June, 1,050 tons at \$26 per ton, bullion.....	\$27,800
Profit on 1,050 tons concentrated, at \$4 per ton of ore....	<del>200</del>
	<hr/> \$31,500
Total expenditure to 1st June with two months' supplies on hand ... ..	28,526
	<hr/>
Profit first 6 months, over all expenditure.....	\$2,974
Of course it is assumed that the money to start the mine is supplied for working capital, say.....	30,000
Deduct all expenditure for the first 6 months, including plant.....	28,526
	<hr/>
Balance on hand 1st June.....	\$1,474
Add to this the product of the mine as per above statement	31,500
	<hr/>
Showing cash on hand in favour of the mine to begin next year's operations with, and 2 months' supplies on hand	\$32,974

The next year succeeding the first 6 months, carrying the above balance down, and continuing the mine on the same basis, the returns and expenditure for the year, I estimate, from the showing of the tests to be as per Schedule B, as follows :

Balance carried down from first 6 months.....	\$32,974
Receipts from the mine, 1 year.....	126,000
	<hr/>
	\$158,974
Permanent improvements to be made this year.. \$11,000	
Other expenses for the year.....	29,395
	<hr/>
	40,395
	<hr/>
Net profits at the end of the 18 months.....	\$118,579

Should the mine continue as the showing now is its capacity could be raised to 100 tons a day, and in the event of which, approximate estimates of product and running expenses for a year would be as follows:

Bullion product of mine, 1 year .....	\$900,000
Expenses of running mine, 1 year.....	175,000
Net profits for the year.....	\$725,000

The above estimates show a mine of great value, and when worked 100 tons a day (which is not by any means the extent to which it could be raised), they show that the mine would pay over ten per cent. dividend on \$7,000,000. I do not think the estimates unreasonable considering the size of the vein and the yield by the test in New York of a ton of the veinstone unselected.

These tests showed a value in the ton of nearly \$50. In the above estimates I calculated that only \$35 would be saved by milling, and there is no allowance made for the rich ore which is worth some thousands of dollars to the ton. This rich ore is found in bunches through the vein and considerable quantities will at least be found during a year's work if not great "bonanzas."

It is a fissure vein, and I see no reason why it should not carry its size downward as far as mining can go. It is as likely to become larger and richer as it is to get smaller and poorer.. The richest showing ever made in a vein was at the depth of about 2000 feet, that was the great bonanza in the "California" and "Consolidated Virginia," on the "Camstock Lode." The "Calumet and Hecla" mine is richer at 3000 feet down than it was at surface. Working at 100 tons a day, the Jack Fish Lake Lode, allowing it carries its size, would not be worked out to that depth in 40 years.

In conclusion I may state I firmly believe that the Jack Fish Lake mine will prove itself to be one of the rich mines of America.

PETER McKELLAR,

*of Fort William, Mining Expert and Geologist.*

September, 1882.

## SCHEDULE A.

Showing expenses of starting and operating the mine for 6 months to 1st June, when there would still be supplies on hand at the mine for other two months.

Building and house furnishing.....	\$2,000
2 teams of horses, sleighs, waggons, &c.....	800
10 head stamp mill with amalgamating copper plates and rock breaker—capacity 14 tons per day.....	2,830
Duty.....	717½
20 horse power engine and boiler.....	850
10 do engine hoisting machinery.....	750
Circular saw and gearing.....	150
Pump for stamps, &c.....	150
Ropes, oil and sundries.....	552½
2 of Frues Vanners.....	2,000
Transportation.....	1,226
Provisions for 8 months and transportation.....	5,500
Horse feed 8 months.....	800
Blasting materials 8 months.....	1,500
Mining tools, &c.....	1,000
Wages 38 men, manager included.....	7,700
Amount.....	<u>\$28,526</u>

Estimating stamp mill in operation 3 months by 1st June at 14 tons a day, product as follows :

1050 tons at \$26 bullion by copper plates.....	\$27,300
1050 tons concentrated at \$4 profit.....	4,200
Amount of product.....	<u>\$31,500</u>



### SCHEDULE B.

Showing result of working the mine for 1 year, following the 6 months' operations, shown in Schedule A—capacity the same, 14 tons a day.

#### PERMANENT IMPROVEMENTS.

Cost of road from mine to Barril Portage.....	\$7,500	
Steamboat, scow and docks.....	<del>8,500</del>	
	<u>18,500</u>	\$11,000

#### RUNNING EXPENSES.

98 men's wages, including managers.....	<sup>18,500</sup> \$15,500	
Provisions, &c .....	8,395	
Horse feed, including transportation.....	1,000	
Running tug and sundries .....	1,500	
	<u>29,395</u>	\$29,295
		<u>\$40,395</u>

#### THE PRODUCT OF THE MINE FOR A YEAR, AS FOLLOWS:

4,200 tons free millings, at \$26.....	109,200
4,200 tons concentrated yield \$4 per ton.....	16,800
	<u>\$126,000</u>

No. 1.

P. DE P. RICKETTS, E.M., PH.D.

A. R. LEDOUX, M.S., PH.D.

LEDOUX &amp; RICKETTS,

*Engineers, Chemists and Assayers, 10 Cedar St., New York City.*

## CERTIFICATE OF ASSAY.

No. 2804.

New York, Sept. 12, 1882.

Sir,—The sample of selected gold ore marked "A" and submitted to us for analysis

Contains Gold,	229.90	ozs.	per ton	(2,000 lbs.)
" Silver,	1108.70	" "	" "	" "
Value in Gold,	\$4,752.03	per ton.		
" Silver,	1,219.57	"		

Total value, \$5,971.60 per ton.



NOTE.—We append the button of gold extracted.

Yours obedient servants,

To PETER McKERLER, Esq.,  
Fort William, Ontario.

LEDOUX & RICKETTS.

No. 2.

P. DE P. RICKETTS, E.M., PH.D.

A. R. LEDOUX, M.S., PH.D.

## LEDOUX &amp; RICKETTS,

*Engineers, Chemists and Assayers, 10 Cedar St., New York City.*

## CERTIFICATE OF ASSAY.

No. 2803.

New York, Sept. 12, 1882.

SIR,—The sample of gold and silver ore marked "Ton lot," and submitted to us for analysis, contains:

	Gold per ton.	Silver per ton.
1st assay.....	1.750 ozs.	11.95 ozs.
2nd " .....	1.762 "	11.65 "
Average ....	1.756 "	11.80 "

Value in gold.....	\$36.30
" " silver.....	12.98
Total value.....	<hr/> \$49.28

NOTE.—The sample represents the average of about one ton of ore submitted to us.

Yours obedient servants,

To PETER MCKELLER, Esq.,  
Fort William, Ontario.

LEDOUX &amp; RICKETTS.



No. 3.

E. N. RIOTTE, M.E.

H. MATHEY, M.E.

NEW YORK METALLURGICAL WORKS,

MATHEY &amp; RIOTTE,

*104 & 106 Washington Street,*

Lot No. 438.

New York, Sept. 18th, 1882.

Mr. Peter McKellar,

Fort William, Ont.

SIR,—250 lbs. of your ore crushed, sampled and assayed, proves to contain

Per assay No. 3818, Gold \$32.66 per ton.

Silver 14.14 “

The ore was run through a stamp battery and the gold caught upon amalgamated copper plates, yielding 160 grains of bullion 477 fine, value \$3.28, equal to a yield per ton of \$26.24 in gold.

The tailings were caught, sampled and assayed, and prove to contain per assay No. 3819, gold \$13.82 per ton, silver \$6.44 per ton.

The tailings were concentrated on a Frue Vanner, yielding 28½ lbs. or 11.4 per cent. of concentrates, which prove to contain per assay No. 3824, gold \$76.62, silver \$5.81 per ton of concentrates.

The tailings after concentration, sampled and assayed, still prove to contain per assay No. 3820, gold \$6.28, silver \$3.14 per ton of tailings.

Very truly,

THE NEW YORK METALLURGICAL WORKS,

By A. GOLDSMITH,

For Society.

, M.E.

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